

PORT PHILLIP SURVEY 1957—1963.

THE FISHERIES.

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SUMMARY.

The history of commercial fishing in Port Phillip is outlined and the quantity and value of catches of the various species is tabulated.

INTRODUCTION.

The physiography of Port Phillip Bay has an important bearing on the extent and scope of its fisheries. Although the area of the Bay is 735 square miles, approximately one quarter of it is over 10 fathoms in depth and here the bottom consists of mud with a limited fauna, which is dominated by small Echinoderms. The sand banks in the shallows and the channels provide the more productive commercial fishing grounds for scale fish. Here, and to a less extent on reefs, line and net gear are used.

Fishing probably started as soon as the early settlers arrived in order to provide the colony with a varied diet. The first formal collection and tabulation of fisheries statistics in Victoria was not attempted until 1903 when the total fish catch at a number of centres was recorded. From 1911 more detailed collections and tabulations were made to show the fish catch by species, the port of landing and the number of licensed fishermen. For the purpose of this account it is sufficient to consider the statistics for the decade 1951—60.

Table 1 shows that the annual fish catch excluding oysters for Port Phillip Bay between 1951 and 1960 ranged from just over 1½ million lb. to just over 2¼ million lb. annually. The catch listed separately for Queenscliff is made up of fish caught inside the Bay as well as flathead and barracouta which may be taken up to ten miles outside The Heads. The catches of crayfish and school shark which are taken in Bass Strait and Tasmanian waters by boats operating from Queenscliff are not included in this table.

The table shows that the fish catch for Port Phillip Bay proper has been stable over the last decade.

* Present address: Inland Fisheries Commission, Tasmania.

TABLE I
FISH CATCH FOR QUEENSCIFF AND REMAINING PORTS OF PORT PHILLIP
BAY 1951-1960

Year	Queenscliff Catch in lb.	Remaining Ports Catch in lb.	Total Catch in lb.
1951	693,000	1,401,000	2,094,000
1952	810,000	1,317,000	2,127,000
1953	916,000	1,315,000	2,261,000
1954	914,000	1,434,000	2,348,000
1955	529,000	1,138,000	1,667,000
1956	364,000	1,354,000	1,718,000
1957	449,000	1,567,000	2,016,000
1958	446,000	1,328,000	1,774,000
1959	635,000	1,267,000	1,902,000
1960	781,000	1,564,000	2,348,000

ORGANIZATION OF THE FISHERY.

Fishing licences were issued free until 1913 when a fee of 2s. 6d. was introduced. Subsequent increases in licence fees were, in 1918 to 5s. in 1930 to 10s. and in 1949 to £2. The early increase in fishing licence fees did not have much effect on the number of licences issued and, as many licence holders were either part-time or amateur fishermen, not a great deal of confidence can be placed on the earlier records in determining the importance of the Port Phillip Bay fishery in the economy of the settlement.

Since 1950 only full-time professional fishermen, i.e., fishermen who obtain a substantial part of their income from fishing, have been licensed to catch fish for sale. From 1950 and 1959 the number of professionals varied from 295 to 268 whereas in 1948 and 1949 the number of fishing licences issued for persons operating in Port Phillip Bay was 643 and 639 respectively. However less than half of these licence holders carried on fishing as a full-time occupation.

The early development of the Port Phillip fisheries was limited to some extent by the absence of suitable facilities for transporting the catch to Melbourne. Before the advent of railways the fish landed at ports such as Sorrento, Queenscliff, Mornington, St. Leonards, Portarlington and Geelong came to Melbourne by boat. To-day nearly all fish come to market by road transport. Traditionally the catch off the Bellarine Peninsula supplied Geelong, primarily, and the surplus, if any, was sent to Melbourne.

The Victorian fish marketing system is a free one whereby fishermen may dispose of their catch by private treaty or by public auction. A fishmarket in Melbourne has a number of agents who simultaneously sell fish on behalf of fishermen. For many years these agents assisted the development of the industry by providing capital to fishermen for the purpose of purchasing boats and gear.

In 1960 the fishing fleet consisted of 229 boats which the fishermen valued at £268,433 and the fishing gear was valued at £53,251. The details of the distribution of the boats and gear by value are shown in Table II. On the basis of investment in boats Williamstown, Queenscliff and Port Melbourne are the most important fishing ports. Geelong, having a small boat fishery, is second to Queenscliff as the base with the largest number of boats and fishermen.

TABLE II.

DETAILS OF VARIOUS PORTS SHOWING THE NUMBER OF BOATS, THEIR VALUE, THE VALUE OF FISHING GEAR AND THE NUMBER OF FISHERMEN IN 1960.

Port.	Number of Boats.	Value of Boats and Tenders.	Value of Gear.	Number of Men.
		£	£	
Black Rock	8	5,774	915	7
Chelsea Carrum	6	1,930	3,995	8
Dromana Rosebud	13	15,545	1,265	14
Frankston	10	3,105	1,150	14
Geelong	27	14,850	7,745	40
Mordialloc	10	10,960	4,986	16
Mornington	12	3,717	1,360	14
Portarlington	14	10,120	4,160	19
Port Melbourne	12	32,850	4,064	23
Queenscliff	36	63,210	4,700	49
Sorrento	24	20,220	4,641	46
St. Kilda	12	6,365	5,205	18
St. Leonards	16	10,980	3,050	22
Werribee	9	4,200	1,960	16
Williamstown	20	64,607	4,070	29
Total	229	268,433	53,251	335

BOATS.

The grounds are sufficiently close to the home ports for fishing operations to be followed on a daily schedule. The boats in the various fisheries are of simple design and range in size from 20 to 30 feet overall in length. The smaller boats are powered by petrol driven engines and those over 30 feet are diesel powered. Until the mid nineteen twenties the sail was the usual method of propulsion for fishing vessels operating in Port Phillip Bay.

The larger vessels operate in waters outside the Bay and land the catch at their home port or at Melbourne. These boats carry echosounders, two-way wireless, refrigeration or fish well and make trips of several weeks' duration to Bass Strait. Most boats are multi-purpose in being suitable for using the fishing method appropriate for the season and species of fish accessible. The size analysis of the fishing fleet operating from the various ports in Port Phillip in 1960 is shown in Table III.

TABLE III.

SIZE ANALYSIS OF FISHING BOATS REGISTERED IN PORT PHILLIP BAY 1960.

Port.	Number of Boats of Various Length Groups.								
	10-20 feet.	20-25 feet.	25-30 feet.	30-35 feet.	35-40 feet.	40-45 feet.	45-50 feet.	50-55 feet.	Over 60 feet.
Black Rock	6	1	..	..	1	..	..	..	..
Chelsea-Carrum	4	1	..	1	..	..	..	..	..
Dromana-Rosebud	1	9	2	1	..	..	..	..	..
Frankston	8	2	..	..	..	..	..	..	..
Geelong	10	4	10	3	..	..	..	..	..
Mordialloc	3	2	2	2	1	..	..	..	..
Mornington	6	3	3	..	..	..	..	..	..
Portarlington	1	9	4	..	..	..	..	..	..
Port Melbourne	7	1	3	..	..	..	..	..	..
Queenscliff	10	10	7	5	3	..	..	..	..
Sorrento	12	8	2	1	..	1	..	..	..
St. Kilda	5	1	4	2	..	..	..	..	..
St. Leonards	6	8	2	..	..	..	..	..	..
Werribee	4	2	3	..	..	..	..	..	..
Williamstown	8	1	2	2	1	..	3	1	2
Total	91	62	44	17	6	1	3	1	2

FISHING METHODS.

The species catch by weight for the decade 1951 to 1960 for Queenscliff and for the remaining ports of Port Phillip is set out in Tables IV. and V. respectively.

The fishing methods used in Port Phillip Bay are limited to the use of the simple traditional gears; trawling is not permitted. Hand lining is used to catch Snapper (*Chrysophrys auratus*, Cuvier and Valenciennes) migrating through the entrance; trolling is used for Snook (*Australuzza novaehollandiae* (Gunther)), and Barracouta (*Leionura atun* (Euphrasen)).

Fishermen from southern Europe introduced the long-line method for such species as Snapper, Rockling (*Genypterus blacodes* Bloch and Schneider) and Rock Cod (*Physiculus barbatus* (Gunther)), in the early nineteen twenties and this method, with a limitation on the number of hooks which a fisherman may use, is permitted only during the autumn and winter months.

The characteristics of long lines used to take Rockling are further regulated in that the construction material in the snoods, the type of bait and the maximum hook size are specified.

From late spring until autumn several types of beach seine nets are used to catch a number of species of fish and molluscs, namely Australian Salmon (*Arripis trutta* Foster) Snook, Sea Garfish (*Hemirhamphus melanochir* Valenciennes), Ruff (*Arripis georgianus* Cuvier and

TABLE IV.
ANNUAL CATCH OF FISH AND CRAYFISH IN LB. QUEENSCLIFF 1951-1950.

Species.	1951.	1952.	1953.	1954.	1955.	1956.	1957.	1958.	1959.	1960.
Anchovy	360	..	475	..	..	978	..	419
Australian salmon	..	116,998	66,329	39,806	21,156	47,139	18,166	12,070	19,964	39,322
Barracouta	..	528,029	686,065	623,032	359,312	230,166	314,618	305,448	477,925	633,244
Butterfish	63	642	410	..	615	132	142	188
Flathead, rock	340	297	615	..	..	679
Flathead, sand	..	4,746	22,880	29,504	16,011	18,716	6,458	10,257	3,791	54,529
Flounder	..	1,582	86	40	316	985	1,057	193	4	157
Garfish	..	9,315	7,402	3,283	6,034	5,589	5,817	3,435	3,935	8,843
Mullet, sea
Mullet, yellow-eye	..	2,061	4,233	5,677	2,498	8,868	5,703	2,035	4,057	8,617
Pitchard	70	..	..	..	1,759
Rock cod	..	1,819	178	2,700	206	31	44	..	1,514	1,978
Rock ling	..	65	65	132	7	80	..	6	303	153
Ruff	..	2,467	..	8,331	4,836	..	12,373	19,107	5,294	902
Shark, gummy	33	256	1,075	861	4,294	12,058	9,811	4,053
Shark, school	..	120,813	119,433	158,263	61,149	13,470	47,769	30,694	57,497	45,613
Snapper	..	13,276	16,313	9,851	5,757	8,038	7,612	12,511	17,186	19,949
Snook	..	2,151	5,213	1,113	1,313	426	2,696	2,326	3,305	4,852
Sprat, blue	1,000	..	..	..	..	2,400	180	629
Trevally, silver	..	1,312	395	263	28	210	..	4	..	44
Whiting, King George	..	1,505	1,214	652	5,383	1,653	1,915	525	70	469
Yellowtail kingfish	..	2,446	7,669	2,793	9,245	5,153	1,858	292	11,293	8,214
Mixed species	..	1,295	1,211	7,292	9,575	9,912	4,661	8,031	2,923	13,432
Annual Total	692,460	809,834	940,142	893,630	505,178	351,664	436,271	422,502	619,194	848,045
Crayfish	82,128	80,820	48,132	64,588	45,697	63,563	57,701	126,828

TABLE V.
ANNUAL CATCH OF FISH IN LB., PORT PHILLIP BAY EXCLUDING QUEENSCLIFF 1951-1960.

Species.	1951.	1952.	1953.	1954.	1955.	1956.	1957.	1958.	1959.	1960.
Anchovy ..	23,011	18,207	59,714	134,340	14,804	14,784	44,338	99,233	12,995	57,877
Australian salmon ..	320,132	254,418	202,342	258,152	146,037	185,712	163,370	306,909	148,833	200,183
Barracouta ..	27,515	41,205	41,504	65,629	62,836	60,650	50,076	21,955	61,941	47,751
Butterfish ..	2,297	3,272	8,123	10,211	13,738	13,347	16,217	12,805	10,289	5,721
Flathead, rock ..	1,252	887	311	350	7,952	6,914	9,402	12,787	11,601	30,751
Flathead, sand ..	340,037	313,140	420,606	364,987	388,433	360,707	325,372	306,000	284,690	277,891
Flounder ..	25,335	23,408	12,426	15,346	11,865	22,433	25,270	11,534	13,308	17,343
Garfish ..	132,979	139,046	127,132	172,981	65,582	148,577	106,891	56,515	66,001	81,094
Mullet, sea ..	5	472	962	1,611	2,944	4,593	1,671	2,628	3,152	2,429
Mullet, yellow-eye ..	30,305	64,508	95,129	44,956	30,164	29,544	30,729	69,912	30,931	32,300
Pilehard ..	102,384	77,021	9,750	40,255	122,122	159,204	7,785	26,343	176,412	324,705
Rock cod ..	9,067	29,813	20,400	32,526	25,418	21,206	17,353	9,059	11,181	29,215
Rock ling ..	2,584	391	8,511	27,466	17,560	6,182	3,747	5,648	4,694	2,356
Ruff ..	43,609	20,977	1,241	37,012	17,198	6,288	385,161	81,556	37,728	4,298
Shark, gummy ..	81,277	69,015	43,428	24,495	18,973	19,268	21,506	46,351	40,425	49,560
Shark, school ..			2,889	4,213	4,628	3,804	3,798	3,228	988	582
Snapper ..	133,081	175,291	183,155	112,671	146,548	77,720	71,136	77,430	93,301	94,315
Snook ..	23,519	30,434	51,762	32,100	14,998	128,467	106,788	51,234	65,497	101,196
Sprat, blue ..	19,420	10,342	25,026	18,406	27,404	18,141	26,394	70,551	41,896	53,855
Trevally, silver ..	15,722	29,124	7,949	5,179	9,078	7,293	30,168	7,732	5,884	10,686
Whiting, King George ..	44,365	46,966	26,994	8,265	26,641	63,503	22,016	28,832	46,596	45,563
Yellowtail kingfish ..	7,013	578	2,832	1,713	4,155	373	211	330	3,767	3,015
Mixed species ..	3,600	13,213	11,117	17,403	14,629	28,078	48,357	24,273	40,219	32,860
Annual Total ..	1,388,509	1,361,728	1,363,303	1,430,267	1,193,707	1,386,788	1,617,656	1,292,845	1,212,329	1,505,546

Valenciennes), Snapper, Silver Trevally (*Usacahanx nobilis* (Macleay)), King George Whiting (*Sillaginodes punctatus* Cuvier and Valenciennes), Leatherjackets (*Cantherines* spp.) Yelloweye Mullet (*Aldrichetta forsteri* (Valenciennes)), Yellowtail Kingfish (*Seriola grandis* (Castelnau)), Flounder (*Rhombosolea tarpirina* (Gunther)) and Squid (*Sepioteuthis australis* (Quoy and Gaimard)).

A modification of the beach seine gear has been evolved to catch snapper which are on sand or reef. The hauling ropes and the net itself are heavily buoyed with six gallon drums as floats enabling the gear to be lifted over reefs. The hauling ropes may be up to 1,000 yards in length and the net is pulled ashore by means of petrol driven winches mounted on the beach or in two boats at anchor. The efficiency of the gear is limited by strong tides or by a slight sea.

Three important mesh net fisheries operate during the winter and spring months; the first is for the Sand Flathead (*Trudis bassensis* Cuvier and Valenciennes), Longnose Flathead (*T. caeruleopunctata* (McCulloch)), and Rock Flathead (*Leviprora laevigata* (Cuvier and Valenciennes)); the second is for Flounder (*Rhombosolea tarpirina* (Gunther)); the third is for Gummy Shark (*Mustelus antarcticus* (Gunther)). Until recently fishermen limited the catch of the Sand Flathead because of buyer resistance to it, in the round. However, recently a fishermen's co-operative society stimulated the demand for this species by establishing a new market for the larger sized fish as frozen fillets.

A small fishery to supply the anglers bait trade existed for many years around Port Phillip; drop nets were used to catch the Pilchard (*Sardinops neopilchardus* (Steindachner)) and the Australian Anchovy (*Engraulis australis* (Shaw)). In the absence of a demand for these species for processing, more efficient gear such as the purse lampara net, has been used only to a limited extent since its introduction in 1950. In 1960 this disability was overcome when a Melbourne cannery offered to process large quantities of Pilchards. A 75 boat was rigged for purse seining, with a suitable knotless nylon net, a purtic power block and powerful lamps.

Unfortunately after a few promising catches of several tons the venture failed, mainly for two reasons. The catches contained both Anchovy and Pilchard and the process of separating them proved costly. Secondly, it was found that on a number of occasions an operation showing prospects of success would be ruined when barracouta caused the schools to disperse. The temporary abundance of fresh Pilchards from this venture stimulated the demand for this fish from the New Australian settlers for use as food.

For many years the mollusc fisheries in Port Phillip were restricted to a portion of Geelong Outer Harbour where the Mud Oyster (*Ostrea angasi* (Sowerby)), is dredged in the winter months. Fishermen are limited by law to a catch of 30 bushels of Mud Oysters in any one week.

Originally the Squid caught in seine nets was utilized exclusively as bait by anglers and commercial fishermen. After 1945 the arrival of

migrants from southern Europe increased the demand for use as food to such an extent that over 100,000 lb. were caught in 1959 from Port Phillip Bay alone.

The Mussel (*Mytilus planulatus* Lamarck) also once only utilized as bait for anglers, is now taken in quantity and bottled for human consumption. Mussels are taken by scraping from piles or by diving on sand or mud. Dredging for Mussels proved unsatisfactory as the removal of sand from the animal is difficult.

Since 1959 small quantities of Haliotis or Abalone (*Schismotis levigata* Donovan and *Notohaliotis ruber* Leach) which occur on the reefs mainly in the southern end of Port Phillip have been harvested by skin divers for canning.

THE SCALLOP FISHERY.

This fishery is considered separately here because of its recent origin and because of the influence the ecological survey had on its development and subsequent management.

In 1949-50 some trial dredgings for the Scallop (*Pecten alba* Tate) were carried out (Lynch 1963). More detailed information concerning the distribution of the scallop concentrations in terms of number per square yard for the various beds was obtained in the course of the survey proper. As this information was of interest to fishermen it was made available in the hope of encouraging the establishment of a small commercial fishery. The most promising beds awaiting development were indicated as occurring off Dromana, Point Cook, Portarlington, Williamstown and Rickets Point in depth from 7-10 fathoms. The yield of edible "meat" from the catch taken in the trial dredgings averaged 39 lb. per 1,000 scallops.

No formal legislation for gear specifications was recommended but fishermen were encouraged to use a dredge with a catching blade 4 feet wide. The undulating sea floor and the strong run of the tide made the use of heavier sled type dredges desirable.

In anticipation of the development of a fishery, a proclamation in 1960 declared the Scallop a fish for the purpose of the Fisheries Act.

Serious dredging for scallops on a full time basis in Port Phillip Bay commenced on 23rd September, 1963, when W. A. Donaldson began operations in his converted Danish seine trawler "Coldstream". Donaldson used two sputnik dredges, the design of which incorporates sled type runners, a depressor plate which holds the dredge firmly on the bottom and allows it to be towed at a greater speed without lifting. It has adjustable teeth on the dredge blade.

The sputnik dredges became the standard equipment for the other fishermen entering the fishery in Port Phillip.

Tasmanian fishing boats and crews dominated the early stages of development but later Victorian boats and fishermen entered the fishery.

The Scallop fishery of Port Phillip Bay has several unique features. First, it commenced mainly as a result of information made available from Departmental trial dredgings and ecological investigation. Secondly, the fact that this investigation preceded the establishment of the fishery should facilitate later comparative studies with the objective of providing a monitoring service on the fishery. The collection of detailed catch and effort statistics commenced with the fishery and at the same time a weekly catch sampling programme was put into operation.

RECREATIONAL FISHERIES.

There are 143 nautical miles of foreshore around Port Phillip and much of it is used by the 1,900,000 bayside residents as well as by visitors from inland centres. Facilities provided by the Ports and Harbours Branch, Public Works Department, include a number of jetties. Hire boat proprietors cater for the fishing needs of the non boatowner. This service, together with the development of mobile lightweight trailer-borne craft and reliable high powered outboard engines, has increased the angler useage of Port Phillip. There is no saltwater fishing licence needed to fish in Victoria so a direct measure of the angling intensity in Port Phillip is difficult to obtain.

To obtain an estimate of the number of boats fishing in Port Phillip, an aerial census was carried out by three observers on the morning of Sunday, January 28, 1962. Figure 1 shows that on this morning 1,208 boats were fishing in Port Phillip Bay. Routine patrols by officers of the Fisheries and Wildlife Department confirm that this figure is usual for a pleasant weather angling weekend. Figure 1 shows that less than .5 per cent. of the boats fished the central mud basin. The preferred localities were reefs, channels or sand banks.

By far the most sought after fish by anglers is the Snapper. It is accessible to anglers in greatest numbers between November and April. In respect to numbers and weight of fish taken by anglers, the Sand Flathead is the most important angling fish in Port Phillip Bay. It provides angling throughout the whole year. The King George Whiting, is angled in the shallower waters near *Zostera* beds from late spring until early autumn. The Sea Garfish, is angled from jetties around the Bay in the autumn.

The spearing of Flounder, and Longnose Flathead, is common on all sandy beaches particularly in autumn. Since 1955 underwater spear-fishing has become a very popular hobby off rocky headlands and on the shallow reefs. The main species of fish taken by this method are Butterfish (*Dactylophora nigricans* Richardson), Port Jackson Shark, (*Heterodontus portusjacksoni* (Meyer)), Marbled Kelp Fish (*Dactylopagrus arctidens* Richardson), and Longnose Flathead. Also divers using snorkel or self-contained apparatus collect edible shellfish.



FIG. 1—Distribution of fishing boats in Port Phillip Bay on 28th January, 1962.

To date the fisheries of Port Phillip have been managed to satisfy the somewhat conflicting needs of the recreational and commercial fishermen. To do this, compromise regulations, which are not ideally suited to either objective, have been necessary. However, while the substantial commercial fishery continues to operate and with recreational needs on the increase, it seems that the compromise method of management is the most suitable one at least in the foreseeable future.

ACKNOWLEDGMENTS.

Fisheries and Wildlife Department, made available statistics relating to the scallop catch and the number of boats operating in the fishery from February to July, 1964.

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